

International Application No.  
PCT/GB2003/004330

National Stage  
Preliminary Amendment

Please amend page 10, line 2 as follows:

“Claims

We claim:

1. A pump comprising a rotor element . . .”

IN THE CLAIMS

1. (currently amended) A pump comprising:  
a rotor ~~element~~ and a stator ~~element~~;  
a housing enclosing the rotor elements and the stator, and the housing having an inlet for receiving pumped fluid, and a port downstream from the inlet, ~~at least one port~~; and  
means for injecting, into the housing via ~~said at least one~~ the port, a fluid for acting on deposits ~~located on the element a surfaces~~ surface of the rotor and a surface of the stator to enable the removal of said the deposits to be removed therefrom.
2. (currently amended) ~~A The pump according to Claim 1, comprising wherein the port is a plurality of said ports.~~
3. (currently amended) ~~A The pump according to Claim 2, wherein the ports are located radially about the housing.~~
4. (currently amended) ~~A The pump according to Claim 2 or 3, wherein the ports are located along the a length of the rotor element.~~
5. (currently amended) ~~A The pump according to any preceding claim~~ Claim 2, wherein at least one of the ports includes a nozzle ~~through which, in use, for spraying fluid is sprayed.~~
6. (currently amended) ~~A The pump according to Claim 5, wherein the nozzle is integrally formed within at least one of the ports.~~
7. (currently amended) ~~A The pump according to any preceding claim~~ Claim 6, wherein the housing comprises a two skinned wall, ~~a cavity being formed between~~ having an inner skin and an outer skin of the wall, ~~through which, in use, a liquid may be passed and forming a cavity therein.~~
8. (currently amended) ~~A The pump according to claim 7, wherein the inner skin of the~~

housing ~~provides~~ is adapted to form the stator ~~element~~.

9. (currently amended) A ~~The~~ pump according to ~~any preceding claim~~ Claim 1, wherein the pump is a screw pump ~~comprising~~ having two threaded rotors ~~elements~~.

10. (currently amended) A ~~The~~ screw pump according to; Claim 9, wherein the port is located downstream of a ~~after the~~ first two complete turns of thread of each of the two treaded rotors ~~elements from the inlet~~.

11. (currently amended) A ~~The~~ pump according to ~~any of claims 1 to 8~~, wherein the pump is a claw pump.

12. (currently amended) A ~~The~~ pump according to ~~any of claims 1 to 8~~, wherein the pump is a Roots pump.

13. (currently amended) A ~~The~~ pump according to ~~any preceding claim~~ Claim 1, wherein the fluid for acting on deposits is a liquid.

14. (currently amended) A ~~The~~ pump according to ~~any preceding claim~~ Claim 1, wherein the fluid for acting on deposits is a solvent ~~for dissolving particulates collected on the rotor element when the pump is in use~~.

15. (currently amended) A ~~The~~ pump according to ~~any of Claims 1 to 12~~, wherein the fluid for acting on deposits is a gas.

16. (currently amended) A ~~The~~ pump according to Claim 15, wherein the fluid for acting on deposits is steam.

17. (currently amended) A ~~The~~ pump according to ~~any of Claims 1 to 15~~, wherein the fluid comprises a reactive substance for reacting with the ~~particulates~~ deposits.

18. (currently amended) A pump comprising:  
a rotor ~~element~~ and a stator ~~element~~;  
a housing enclosing the rotor elements and the stator and having ~~at least one~~ a port; and  
means for injecting, into the housing via ~~said at least one~~ the port, a fluid comprising a  
reactive substance for reacting with particulates ~~located on the element~~ a surfaces of the rotor  
and a surface of the stator to enable ~~said the~~ particulates to be removed therefrom.
19. (currently amended) ~~A~~ The pump according to Claim ~~17 or~~ 18, wherein the fluid  
comprises a halogen, ~~such as fluorine~~.
20. (currently amended) ~~A~~ The pump according to ~~any of Claims 17 to 19~~ 18, wherein the  
fluid comprises one of  $\text{ClF}_3$ ,  $\text{F}_2$ , and  $\text{NF}_3$ .
21. (cancelled)
22. (currently amended) A method of managing deposits within a pump, the pump  
comprising a rotor ~~element~~ and a stator ~~element~~, and a housing enclosing the rotor elements and  
the stator ~~and~~, the housing having an inlet for receiving pumped fluid, and downstream from the  
inlet, ~~at least one~~ a port, the method comprising:  
injecting, into the housing via ~~said at least one~~ the port, fluid for acting on deposits  
~~located on the element~~ a surfaces of the rotor and a surface of the stator to enable ~~said removal of~~  
the deposits from the surfaces ~~to be removed therefrom~~.
23. (currently amended) ~~A~~ The method according to Claim 22, wherein the port ~~fluid is~~  
~~injected from~~ a plurality of said ports.
24. (currently amended) ~~A~~ The method according to Claim 23, wherein the ports are located  
radially about the housing.
25. (currently amended) ~~A~~ The method according to ~~any of Claims 22-23 to~~ 24, wherein the  
ports are located along ~~the~~ a length of the rotor ~~element~~.

26. (currently amended) A-~~The~~ method according to ~~any of Claims 22 to 25~~, wherein the fluid for acting on deposits is a liquid.

27. (currently amended) A-~~The~~ method according to ~~any of Claims 22 to 26~~, wherein the fluid for acting on deposits is a solvent ~~for dissolving particulates collected on the rotor element when the pump is in use.~~

28. (currently amended) A-~~The~~ method according to ~~any of Claims 22 to 25~~, wherein the fluid for acting on deposits is a gas.

29. (currently amended) A-~~The~~ method according to Claim ~~26~~28, wherein the fluid for acting on deposits is steam.

30. (currently amended) A-~~The~~ method according to ~~any of Claims 22 to 29~~, wherein the fluid for acting on deposits comprises a reactive substance for reacting with the ~~particulates~~ deposits.

31. (cancelled)

32. (currently amended) A-~~The~~ method according to Claim ~~30 or 31~~22, wherein the fluid comprises a halogen, ~~such as fluorine.~~

33. (currently amended) A-~~The pump method~~ according to ~~any of Claims 30 to 32~~22, wherein the fluid comprises one of  $\text{ClF}_3$ ,  $\text{F}_2$ , and  $\text{NF}_3$ .

34. (currently amended) A-~~The~~ method according to ~~any of Claims 22 to 33~~, wherein the fluid is injected through the port at predetermined intervals ~~during operation.~~

35. (currently amended) A-~~The~~ method according to ~~any of Claims 22 to 34~~, further comprising the steps of:

- (a) monitoring the performance of the pump;
- (b) determining the accumulation of the deposits on the internal ~~element~~ surfaces based on the monitored performance;
- (c) calculating a ~~fluid rate of~~ flow rate of fluid for acting on deposits required to compensate for the accumulation of the deposits ~~as determined in step (b)~~; and
- (d) adjusting the ~~rate of flow rate of the fluid for acting on deposits injected fluid to~~ reflect the calculated rate of flow of fluid for acting on deposits ~~value from step (c)~~.

36. (currently amended) A method for managing deposits within a pump mechanism by ~~introducing~~ delivering to a rotor of the pump, a fluid suitable for dissolving, diluting or otherwise disengaging deposits which have accumulated on the internal working surfaces of the pump, the method comprising the steps of:

- (a) monitoring the performance of the pump;
- (b) calculating the rate of accumulation of the deposits on the internal working surfaces of the pump based on the monitored performance;
- (c) calculating a ~~fluid rate of~~ flow rate of the fluid, required to compensate for the accumulation of the deposits ~~as determined in step (b)~~; and
- (d) ~~effecting an adjustment of~~ adjusting the rate of flow rate of the fluid being delivered to the rotor to reflect the calculated rate of flow of the fluid ~~value from step (c)~~.

37. (currently amended) A ~~The~~ method according to Claim 35 ~~or~~ 36, wherein the pump is inoperative as the fluid is delivered, the method further comprising the step of applying torque to rotors of the pump to overcome any remaining impeding force.

38. (currently amended) A ~~The~~ method according to Claim 37; further comprising the steps of:

- introducing a thermal fluid into a cavity ~~provided~~ formed within ~~the~~ a housing of the pump, the cavity encircling the rotors;
- and heating the thermal fluid in the cavity to raise the temperature of the fluid and the deposits ~~sufficiently to release the deposits prior to the torque~~ the step of applying torque to the rotors.

39. (cancelled)
40. (cancelled)
41. (cancelled)
42. (new) The pump according to Claim 4, wherein at least one of the ports includes a nozzle for spraying fluid.
43. (new) The pump according to Claim 42, wherein the nozzle is integrally formed within at least one of the ports.
44. (new) The pump according to Claim 5, wherein the fluid for acting on deposits is a liquid.
45. (new) The pump according to Claim 44, wherein the fluid for acting on deposits is a solvent.
46. (new) The pump according to Claim 5, wherein the fluid for acting on deposits is a gas.
47. (new) The pump according to Claim 46, wherein the fluid for acting on deposits is steam.
48. (new) The pump according to Claim 5, wherein the fluid for acting on deposits comprises a reactive substance for reacting with the deposits.
49. (new) The pump according to Claim 48, wherein the fluid comprises a halogen.
50. (new) The pump according to any of Claim 48, wherein the fluid comprises one of  $\text{ClF}_3$ ,  $\text{F}_2$ , and  $\text{NF}_3$ .
51. (new) The pump according to Claim 1, wherein the housing comprises a two skinned

wall having an inner skin and an outer skin and forming a cavity therethrough.

52. (new) The pump according to claim 52, wherein the inner skin of the housing is adapted to form the stator.

53. (new) The pump according to Claim 1 wherein the pump is connected to a chemical vapor deposition apparatus having a process chamber and an outlet of the process chamber, wherein the pump inlet is connected to the outlet of the process chamber, and wherein the deposits are a by-product of a chemical vapor deposition process.

54. (new) The method according to Claim 23, wherein the fluid is injected through the ports at predetermined intervals.